DISPLAY DEVICE OF ELEVATOR

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Inventor: ISHIKAWA TORU
Applicant: TOKYO SHIBAURA ELECTRIC CO
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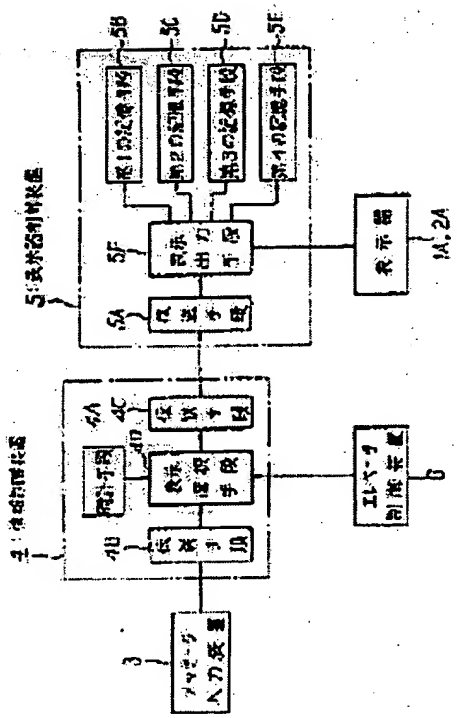
Abstract of **JP4125274**

PURPOSE:To display the information of high reliability by storing the time information in the third memory means, while storing general information in the first and the second memory means and displaying them at specific display times. CONSTITUTION:A display selecting means 4D delivers a general information at the time prior a specific time to a designated display time, and a display output means 5F stores the information to either one side of the first and the second memory means 5B and 5C, and displays it at a designated display time. And during the display time, a new general information delivered from the display selecting means 4D is stored to the other side of the first and the second memory means 5B and 5C, and it is displayed at a designated display time. And the time information delivered from the display selecting means 4D is stored in the third memory means 5D and displayed. As a result, the display of the time information and the display of the general information designated at that time can be synchronized. Consequently, highly reliable informations can be displayed.



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⑭発明の名称　エレベータの表示装置

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⑫発明者　石川　徹　東京都府中市東芝町1　株式会社東芝府中工場内
⑪出願人　株式会社東芝　神奈川県川崎市幸区堀川町72番地
⑭代理人　弁理士　佐藤　一雄　外3名

明　細　書

1．発明の名称

エレベータの表示装置

2．特許請求の範囲

時刻情報を出力する時計手段と、一般情報およびその表示時刻を設定するメッセージ入力装置と、かご内および乗り場の少なくとも一方に設置された表示器と、前記時刻情報および一般情報を入力し、時刻が変化する毎に前記時刻情報を送出すると共に、指定された表示時刻よりも所定の時間だけ前の時刻に前記一般情報を送出する情報選択手段と、前記表示器に表示すべき情報を記憶する第1、第2および第3の記憶手段と、前記情報選択手段から送出された前記一般情報を前記第1および第2の記憶手段のいずれか一方に記憶させて指定された表示時間に前記表示器に表示させ、この表示中に前記情報選択手段から送出された新たな前記一般情報を前記第1および第2の記憶手段のいずれか他方に記憶させて指定された表示時間に前記表示器に表示させると共に、前記情報選択手段から送出された時刻情報を前記第3の記憶手段に記憶させて前記表示器に表示させる表示出力手段とを備えたことを特徴とするエレベータの表示装置。

3．発明の詳細な説明

〔発明の目的〕

（産業上の利用分野）

この発明は、エレベータのかご内および乗り場の少なくとも一方に設置された表示器に時刻およびメッセージの両方を表示するエレベータの表示装置に関する。

（従来の技術）

近年、エレベータの利用客への情報提供装置としてかご内や乗り場に表示器を設け、これにエレベータの運転状態を表示させる表示装置が普及しつつある。

また、最近ではエレベータの運転状態だけでな

く、ビル内の一般情報をパソコン等のメッセージ入力装置で設定し、これを表示器に表示させるものが一般化しつつある。

第６図はこの種の従来の表示装置の概略構成図である。同図において、エレベータかご１にかご内表示器1Aが、エレベータ乗り場２に乗り場表示器2Aがそれぞれ設けられている。また、これらの表示器に表示するための一般情報およびその表示時刻情報がパソコン等のメッセージ入力装置３で設定され、情報制御装置４に送り込まれる。情報制御装置４はこれらの情報を格納すると共に、エレベータ制御装置６から送り込まれる表示指令コマンドを格納し、所定の処理を実行した後、内部格納情報および表示指令コマンドを表示器制御装置５へ送り込む。表示器制御装置５は表示指令コマンドに従ってかご内表示器1Aおよび乗り場表示器2Aに情報を出力する。

第７図は情報制御装置４の詳細な構成を示すブロック図で、メッセージ入力装置３の情報を受け取る伝送回路41と、エレベータ制御装置６から情報を受け取る入力回路42と、時刻情報を発生する時計ＩＣ43と、各種の演算処理を実行するＣＰＵ44と、その演算処理に必要な制御手順および固定データを予め書込み、必要に応じてＣＰＵ44に提供するＲＯＭ45と、ＣＰＵ45の演算処理上のワーキングエリアまたは入出力のバッファとして用いられるＲＡＭ46と、表示器制御装置５に情報を送出する伝送回路47とで構成されている。

第８図は表示器制御装置５の詳細な構成を示すブロック図で、情報制御装置４の情報を受け取る伝送回路51と、各種の演算処理を実行するＣＰＵ52と、ＣＰＵ52の演算処理上のワーキングエリアまたは入出力のバッファとして用いられるＲＡＭ53と、ＣＰＵ52の演算処理に必要な制御手順および固定データを予め書込み、必要に応じてＣＰＵ52に提供するＲＯＭ54と、表示器1A，1Bに情報を送出する伝送回路55とで構成されている。

ここで、メッセージ入力装置３を用いて一般情報およびその表示時刻として、例えば、第９図の表示画面31上に表示されているように情報を設定したとする。これらの情報は、伝送回路41を介して、ＣＰＵ44に送り込まれる。ＣＰＵ44はこの情報をＲＡＭ46に格納する。一方、エレベータ制御装置６からかご内表示器1Aおよび乗り場表示器2Aにエレベータの運転状態を表示するための表示指令コマンドが情報制御装置４に送り込まれる。この表示指令コマンドは、入力回路42を介して、ＣＰＵ44に送り込まれる。ＣＰＵ44はこの表示指令コマンドを、時刻情報および一般情報の表示指令コマンドと併せてＲＡＭ46に格納する。第10図はこれらの情報をＲＡＭ46に格納した状態を示し、メモリ領域ＭＳ(1) ～ＭＳ(3) に一般情報が、メモリ領域ＴＳ(1) ～ＴＳ(3) に表示開始時刻が、メモリ領域ＴＥ(1) ～ＴＥ(3) に表示終了時刻が、メモリ領域ＣＯＭに表示指令コマンドがそれぞれ格納される。

また、ＲＡＭ46に表示指令コマンドが格納されたとき、ＣＰＵ44はＲＯＭ45のプログラムに従って演算処理を実行し、一般情報、時計ＩＣ43の時刻情報および表示指令コマンドを表示器制御装置５に送り込む。このときの演算処理動作を第11図のフローチャートを用いて説明する。

先ず、ステップ 301で初期設定し、ステップ 302 の繰返し処理のあと、ステップ 303で時計ＩＣ43の出力情報に変化があったか否かを判定する。そして、変化があったときにはステップ 304 にてその時刻情報を表示器制御装置５に送出する。

次に、ステップ 305で一般情報の切換時刻になっているか否かを判定し、切換時刻になっておればステップ 306にて新一般情報を表示器制御装置５に送り込む。すなわち、時計ＩＣ43の時刻情報と、第10図に示したメモリ領域ＴＳ(1) ～ＴＳ(3) の記憶データとを比較することにより、7:00にメモリ領域ＭＳ(1) の情報を、8:30にメモリ領域ＭＳ(2) の情報を、12:00 にメモリ領域ＭＳ(3) の情報をそれぞれ表示器制御装置５に送り込む。

次に、ステップ 307では、ＲＡＭ46のメモリ領域ＣＯＭにエレベータ制御装置６からの表示指令コマンドが有るか無いかを判定し、その結果に応じてステップ 308で一般情報の表示指令コマンド

を、ステップ 309でエレベータ運転情報の表示指令コマンドをそれぞれ表示器制御装置５に送出する。

続いて、ステップ 302の処理に戻って、上記ステップ 303～ 309の処理を繰返す。

このようにして、かご内表示器1Aおよび乗り場表示器2Aに表示すべき情報が表示器制御装置５に送られると、これらの情報は伝送回路51を介してＣＰＵ52に伝送される。ＣＰＵ52はこれらの情報を、一旦、ＲＡＭ53に格納する。なお、ＲＯＭ54には表示指令コマンドに対応した情報が格納されている。そこで、ＣＰＵ52はＲＯＭ54に格納されたプログラムに従ってこれらの情報を選択すると共に、伝送回路55を介してかご内表示器1Aおよび乗り場表示器2Aに送り込む。

この結果、かご内表示器1Aには、例えば、第５図(a) に示すように、一般情報、日付情報、時刻情報が映出されると同時に、乗り場表示器2Aにも同様な情報が映出される。

（発明が解決しようとする課題）

上述した従来のエレベータの表示装置にあっては、第11図のステップ 304にて時刻情報を出力してからステップ 308にて一般情報の表示指令コマンドを出力するまで１～２秒程度経過してしまう。つまり、ＲＡＭ45に第10図に示した情報が記憶されておれば、8:30になるとメモリ領域ＭＳ(2) の情報を表示させなければならないことになる。したがって、8:30に一般情報を送り込むが、その情報を転送し終わるまでに時間を要し、さらに、一般情報出力指令が送り込まれるまでの処理時間を必要とすることから、メモリ領域ＭＳ(2) の情報は１～２秒程度遅れて表示される。このため、かご内表示器1Aおよび乗り場表示器2Aの時刻表示が8:30になったとしても、メモリ領域ＭＳ(2) の情報は数秒経過してから表示される。

また、この間、時計ＩＣ43の時刻が更新されたか否かの判断をしないため、時刻が不正確に表示されたまま一般情報が表示されることになり、誤った情報で利用客が混乱する恐れがあった。

この発明は上記の問題点を解決するためになされたもので、エレベータのかご内や乗り場に設置された表示器に表示される時刻と、時刻によって表示内容が異なる一般情報とを同期させることのできるエレベータの表示装置を得ることを目的とする。

〔発明の構成〕

（課題を解決するための手段）

この発明は、時刻情報を出力する時計手段と、一般情報およびその表示時刻を設定するメッセージ入力装置と、かご内および乗り場の少なくとも一方に設置された表示器と、前記時刻情報および一般情報を入力し、時刻が変化する毎に前記時刻情報を送出すると共に、指定された表示時刻よりも所定の時間だけ前の時刻に前記一般情報を送出する情報選択手段と、前記表示器に表示すべき情報を記憶する第１、第２および第３の記憶手段と、前記情報選択手段から送出された前記一般情報を前記第１および第２の記憶手段のいずれか一方に記憶させて指定された表示時間に前記表示器に表示させ、この表示中に前記情報選択手段から送出された新たな前記一般情報を前記第１および第２の記憶手段のいずれか他方に記憶させて指定された表示時間に前記表示器に表示させると共に、前記情報選択手段から送出された時刻情報を前記第３の記憶手段に記憶させて前記表示器に表示させる表示出力手段とを備えたことを特徴とするものである。

（作　用）

この発明においては、表示選択手段が指定された表示時刻よりも所定の時間だけ前の時刻に一般情報を送出し、表示出力手段はこの情報を第１および第２の記憶手段のいずれか一方に記憶させて指定された表示時間に表示させ、この表示中に表示選択手段から送出された新たな一般情報を第１および第２の記憶手段のいずれか他方に記憶させて指定された表示時間に表示させるようにしたので、一般情報を伝送するに要する時間遅れおよび表示出力指令が出力されるまでの処理遅れがなくなる。

また、情報選択手段から送出された時刻情報を第３の記憶手段に記憶させて表示させるようにしたので、時刻情報とその時刻に指定された一般情報の表示とを同期させることができる。

（実施例）

第１図はこの発明の一実施例の構成を示すブロック図で、図中、第５図と同一の要素には同一の符号を付してその説明を省略する。

ここで、情報制御装置４は時刻情報を出力する時計手段4Aと、メッセージ入力装置３で設定された情報を取込む伝送手段4Bと、表示情報を表示器制御装置５に伝送する伝送手段4Cと、メッセージ入力装置３の一般情報、時計手段4Aの時刻情報およびエレベータ制御装置６の表示指令コマンドを入力し、指定された表示時刻よりも所定の時間だけ前の時刻に一般情報を送出し、時刻が変化する毎に時刻情報を送出し、さらに、表示指令コマンドを逐次送出する表示選択手段4Dとで構成されている。

また、表示器制御装置５は情報制御装置４からの情報を取込む伝送手段5Aと、表示器1A，2Aに表示すべき一般情報を分けて記憶する二つの記憶手段5B，5Cと、時刻情報を記憶する記憶手段5Dと、エレベータの運転情報を記憶する記憶手段5Eと、表示選択手段4Dから送出された一般情報を記憶手段5B，5Cのいずれか一方に記憶させて指定された表示時間に表示器1A，2Aに表示させ、この表示中に表示選択手段4Dから送出された新たな一般情報を記憶手段5B，5Cのいずれか他方に記憶させて指定された表示時間に表示器1A，2Aに表示させると共に、表示選択手段4Dから送出された時刻情報を記憶手段5Dに記憶させて表示器1A，2Aに表示させ、さらに、エレベータ制御装置６の表示指令コマンドに対応して記憶手段5Eの運転情報を表示器1A，2Aに表示させる表示出力手段5Pとで構成されている。

なお、第１図に示された情報制御装置４の機能は第７図と同一のハードウェアで実現でき、同様に、第１図に示された表示器制御装置５の機能は第８図と同一のハードウェアで実現されるので、本発明に対応するＣＰＵ44の処理手順を示す第２図のフローチャートを用いて表示選択手段4Dの詳細な動作を、ＣＰＵ52の処理手順を示す第３図のフローチャートを用いて表示出力手段5Pの詳細な動作をそれぞれ説明する。

先ず、情報制御装置４を構成するＣＰＵ44は、第２図に示すように、ステップ 101で初期設定し、ステップ 102の繰返しスタート処理を経て、ステップ 103にて時刻情報に変化があるか否かを判定し、変化があればステップ 104で時刻情報を表示器制御装置５に送出する。

次に、ステップ 105で一般情報の表示切換時刻に対してＸ秒前か否かを判定し、その時刻になっておればステップ 106で新たな一般情報を送出する。

ここで、Ｘは次式によって決定される。

$$X = t + \alpha \qquad \cdots (1)$$

ただし

t：一般情報伝送時間

α：切換余裕度（３～５秒）

である。

このことは、例えば、第10図に示すように、メモリ領域ＭＳ(1) の情報の表示指定時間がメモリ領域ＴＳ(1)，ＴＥ(1) に示された7:00～8:30で、メモリ領域ＭＳ(2) の情報の表示指定時間がメモリ領域ＴＳ(2)，ＴＥ(2) に示された8:30～10:00 であったとすれば、一般情報伝送時間t＝１秒、切換余裕度α＝４秒として、時計ＩＣ43の情報が8:29:55 になったときにメモリ領域ＭＳ(2) の一般情報が表示器制御装置５に送り込まれる。

次に、ＣＰＵ44はステップ 107で、エレベータ制御装置６の運転状態表示指令コマンドがあるか否かを判定し、ないときにはステップ 107にて一般情報の切換時刻になっているか否かを判定する。そして、切換時刻になっていなければ前回の一般情報の表示指令コマンドを、切換時刻になっておればステップ 110で新たな一般情報の表示指令コマンドを、さらに、ステップ 107で運転状態表示指令コマンドがあると判定されたときにはステップ 111でエレベータ運転情報の表示指令コマンド

をそれぞれ表示器制御装置５に送り込む。以下、ステップ 102～111 の処理を繰返す。

一方、表示器制御装置５を構成するＣＰＵ52は、第３図のフローチャートに示すように、ステップ 201で初期設定し、ステップ 202の繰返しスタート処理を経て、ステップ 203にて新たな一般情報を受信したか否かを判定する。

ここで、新たな一般情報を受信したと判定すれば、ステップ 204で現在の表示情報が第１の記憶手段としてのＲＡＭ53（第４図）のメモリ領域ＤＭ(1) に記憶されたものであるか否かを判定し、このメモリ領域ＤＭ(1) に記憶されたものであるとすればステップ 205で新たな一般情報を第２の記憶手段としてのＲＡＭ53のメモリ領域ＤＭ(2) に記憶させ、反対に、メモリ領域ＤＭ(1) に記憶されたものでないとすれば、ステップ 206で新たな一般情報をメモリ領域ＤＭ(1) に記憶させる。この記憶状態を第４図(a) に示す。なお、情報制御装置４から送り込まれた時刻情報は、図示省略のメモリ領域に記憶される。また、エレベータ制御情報は、第４図(b) に示すように、ＲＯＭ54に記憶されている。

次に、ＣＰＵ52はステップ 207にて、逐次変化すべき時刻情報がＹ分間変化変化しなかったか否かを判定し、変化がなかったときにはステップ 208 にて現在表示中の時刻情報および一般情報を消去し、ステップ 209で消去フラグを第４図(a) のメモリ領域ＰＲＥＦにセットし、ステップ 207 にて時刻情報が変化したと判定すればステップ 210 でこの消去フラグをクリアする。

次に、ＣＰＵ52はステップ 211でエレベータ運転情報の表示指令コマンドが伝送されたか否かを判定し、この表示指令コマンドがないときにはステップ 212で消去フラグがセットされているか否かを判定する一方、表示指令コマンドがある場合にはステップ 213でＲＯＭ54の運転情報を表示し、以後、ステップ 202～212 の処理を繰返す。また、ステップ 212で消去フラグがセットされている場合もステップ 202～212 の処理を繰返し、反対に、消去フラグがセットされていないときにはステップ 214以下の処理をする。

すなわち、ステップ 215で時刻情報、新たな一般情報および前回の一般情報のうちのいずれに対する表示指令コマンドであるかを判定し、この判定結果に応じてステップ 216で表示時刻を更新し、ステップ 216で新たな一般情報を表示し、ステップ 218で前回の一般情報を表示させて、それぞれステップ 202の繰返し処理に戻る。

第５図はこれらの処理に対応するかご内表示器1Aの表示状態を示し、同図(a) は時刻情報が逐次変化したときのもの、同図(b) はＹ分間時刻情報が変化しなかった時のものである。

かくして、この実施例によれば、切換時刻よりも前の時刻で一般情報を表示器制御装置５に送り、この一般情報の表示時刻になると時刻の切換と同時に一般情報の切換が行われる。

また、情報制御装置４から送り込まれる時刻情報が変化しないとき、時計ＩＣ43の異常と見なして時刻情報および一般情報を消去するので、利用客に誤った情報を伝達するという事態を未然に防止することができる。

なお、上記実施例では、エレベータかご内およびエレベータ乗り場の両方に表示器を設け、この両方に情報を表示するものについて説明したが、本発明はこれに限定されるものではなく、エレベータかご内およびエレベータ乗り場のいずれか一方にしか表示器を設置しないものにも適用できることは言うまでもない。

〔発明の効果〕

以上の説明によって明らかなように、この発明によれば、表示器に表示される時刻と時刻によって切換わる一般情報とを同期して表示させることができる。また、時刻異常時にこれらの表示を消去するようにしたので、誤った情報を表示することに比べて、信頼性の高い情報を表示することができる。

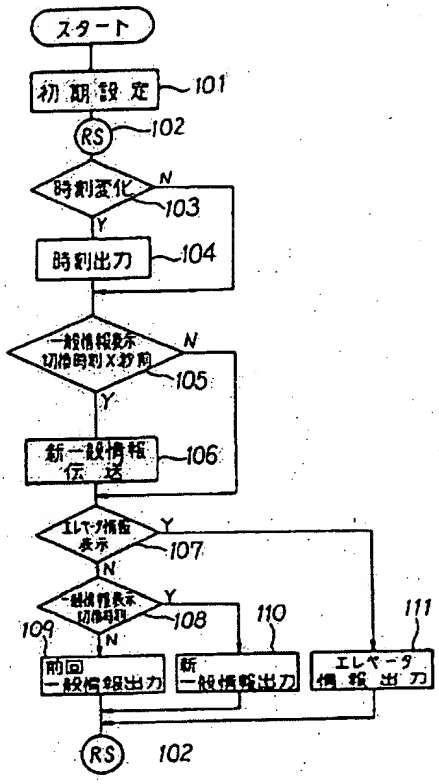
4．図面の簡単な説明

第１図はこの発明の一実施例の構成を示すブロック図、第２図および第３図は同実施例の動作を

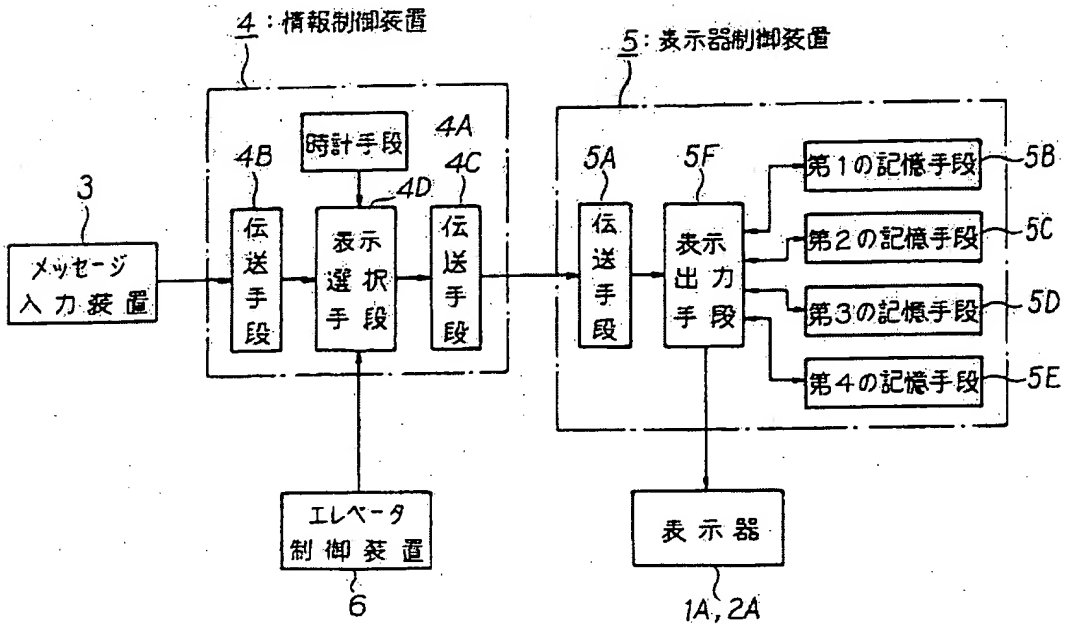
説明するためのフローチャート、第４図(a)，(b)は同実施例を構成する記憶装置の情報記憶状態図、第5図(a)，(b)は同実施例を構成する表示装置の情報表示状態図、第６図は従来のエレベータの表示装置の概略構成図、第７図および第８図は同装置を構成する主要素のハードウェア構成を示すブロック図、第９図は同装置を構成する主要素の情報表示状態図、第10図は同装置を構成する記憶装置の情報記憶状態図、第11図は同装置の動作を説明するためのフローチャートである。

1A…かご内表示器、2A…乗り場表示器、３…メッセージ入力装置、４…情報制御装置、4A…時計手段、4D…表示選択手段、５…表示器制御装置、5B～5E…第１～第４記憶手段、5F…表示出力手段、６…エレベータ制御装置。

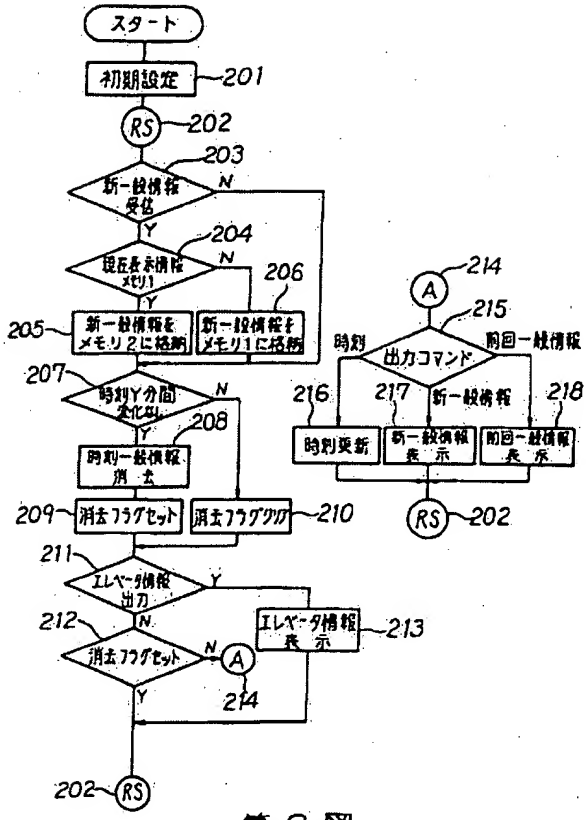
出願人代理人　佐　藤　一　雄



第２図



第１図



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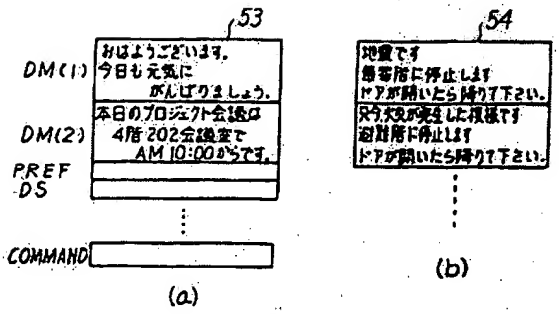

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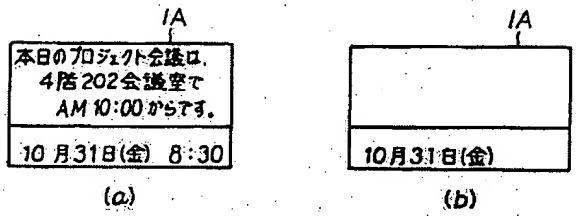

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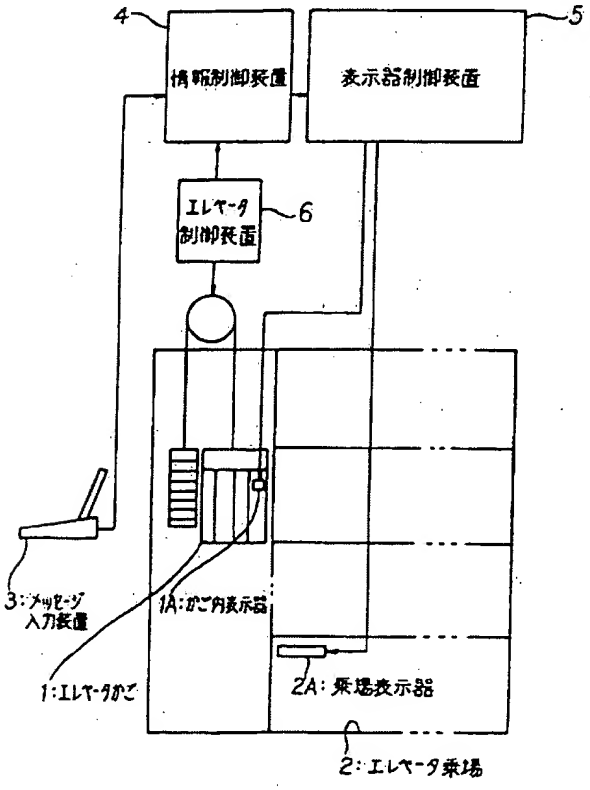

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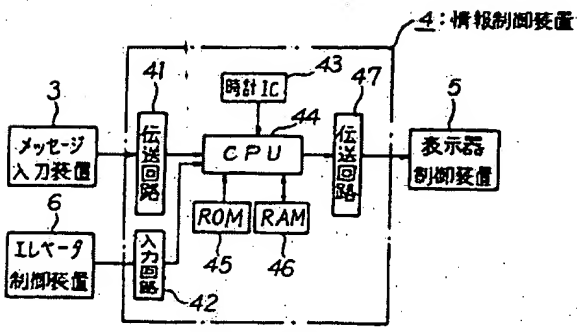

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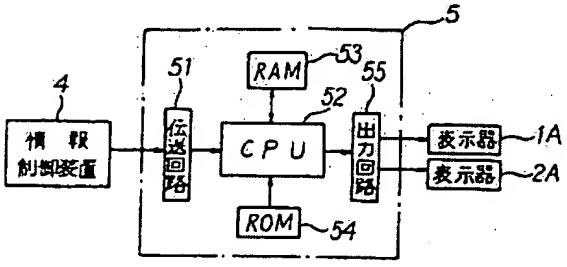

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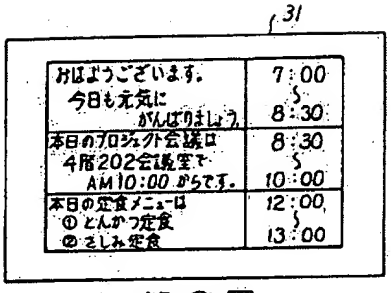
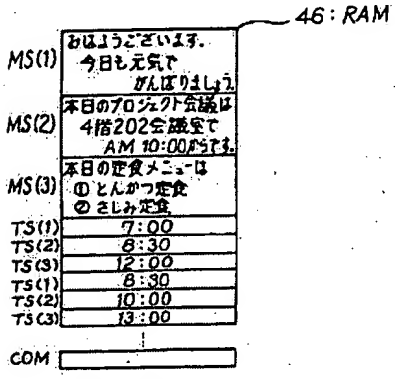
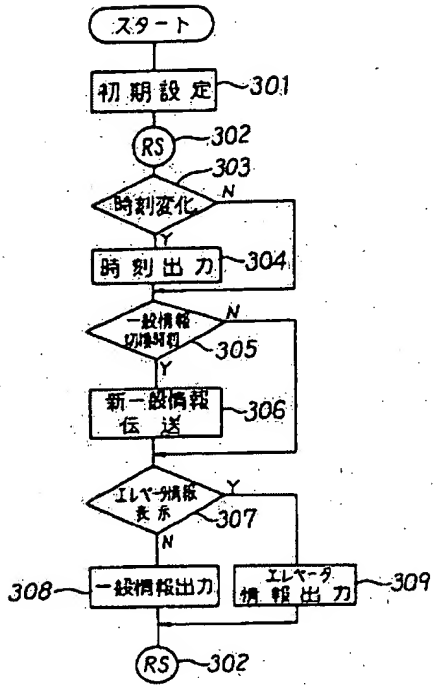


第 9 図



第 10 図



第 11 図

TRANSLATION OF JP4125274

(Translator: Christopher Field, Aug. 1, 2005)

Title of the Invention: Elevator Display Device

(21) Application No. H2-246447

(22) Date of Application: 9-17-1990

(72) Inventor: Toru Ishikawa, Toshiba Fuchu Plant, 1, Shibaura, Fuchu-shi, Tokyo

(71) Applicant: Toshiba Co. Ltd., 72 Horikawa-cho, Kawasaki-shi, Kanagawa-ken

(74) Agent: Kazuo Satoh, Patent Attorney, and 3 others

SPECIFICATION

1. Title of Invention: ELEVATOR DISPLAY DEVICE

2. Claim: An elevator display device comprising a clock means for outputting time information; a message input means for setting general information and the display time thereof; a display installed in at least one of either an elevator car or an [elevator] landing; an information selection means which inputs said time information and general information and outputs said time information each time the time changes, sending said general information at a time which is exactly a specified period prior to a designated display time; first, second, and third storage means which store information to be displayed on said display; and a display output means which causes said information output from said information selection means to be stored in either said first or said second storage means, and to be displayed on said display at a designated display time, causes new said general information sent from said information selection means during this display to be stored in the other of either said first or said second storage means, and to be displayed at a designated display time on said display, and causes time information sent from said information

selection means to be stored on said third storage means and to be displayed on said display.

3. Detailed Description of the Invention

Purpose of the Invention -- Industrial Field of Application

The present invention relates to an elevator display device to display both the time and a message on a display device installed in at least one of an elevator car or a landing.

Prior Art

There has been a growing prevalence in recent years of display devices which place displays in elevator cars, landings, and the like, displaying both the time and messages for the information of elevator users.

It is also becoming more common not only to display the elevator operating state, but also to input general building-related information using message input devices such as personal computers, showing these [messages] on displays.

Fig. 6 is a summary schematic drawing of a conventional display device of this type. In the figure, an in-car display 1A is disposed in an elevator car 1, and a landing display 2A is disposed at an elevator landing 2. General information and display time information for display on these displays is set by a message input device 3 such as a personal computer and sent to an information control device 4. The information control device 4 stores this information as well as display commands sent from an elevator control device 6. After executing specified processing, [the device] sends internal stored information and display commands to a display control device 5. The display control device 5 outputs information to an in-car display 1A and a landing display 2A in accordance with display commands.

Fig. 7 is a block diagram showing the detailed constitution of the information control device 4, which comprises a transfer circuit 41 which receives information [from] the message input device 3, an input circuit 42, which receives information

from the elevator control device 6, a clock IC 43, a CPU 44 which executes various computations, a ROM 45 in which control sequences required for CPU 44 computation as well as fixed data have been previously written for presentation to the CPU 44 as needed, a RAM 46 which is used as a working area for CPU 44 computation and as an I/O buffer, and a transfer circuit 47 which sends information to the display control device 5.

Fig. 8 is a block diagram showing the detailed constitution of the display control device 5, and includes a transfer circuit 51 which receives information [from] the information control device 4, a CPU 52, which executes various computations, a RAM 53 which is used as a working area for CPU 52 computation and as an I/O buffer, a ROM 54 in which control sequences required for CPU 52 computation, as well as fixed data, are stored for presentation to the CPU 52 as needed, and a transfer circuit 55 [*labeled in Fig. 8 as "output circuit"*] which sends information to the displays 1A and 1B.

It is here assumed that general information and the display time thereof such as shown, for example, in the Fig. 9 display screen, have been input using a message input device 3. This information is sent to the CPU 44 through the transfer circuit 41. The CPU 44 stores this information in the RAM 44. In the meantime, a display command to display the elevator operating state on the in-car display 1A and the landing display 2A is sent from the elevator control device 6 to the information control device 4. This display command is sent to the CPU 44 via the input circuit 42. The CPU 44 stores this display command along with display commands for time and general information in the RAM 46. Fig. 10 shows the state in which this various information is stored in the RAM 46. General information is stored in memory area MS(1)-MS(3); display start time is shown in memory area TS(1)-TS(3), display end time is stored in memory area TE(1)-TE(3), and display commands are stored in memory area COM.

When display commands are stored in the RAM 46, the CPU 44 executes computations according to a program in the ROM 45, sending general information,

the clock IC 43 time information, and display commands to the display control device 5. The computing operations which occur at this time are explained using the flow chart in Fig. 11.

First, initialization is performed in Step 301. After repeated processing by Step 302, a determination is made as to whether a change has occurred in the output information from the clock IC 43. If there has been a change, that time information is sent to the display control device 5 in Step 304.

Next, a determination is made in Step 305 of whether or not the time has arrived for switching over the general information; if so, new general information is sent to the display control device 5 in Step 306. That is, by comparing the clock IC 43 time information with the stored data in memory area TS(1)-TS(3) shown in Fig. 10, the information in memory area MS(1) is sent to the display control device 5 at 7:00, the information in memory area MS(2) at 8:30, and the information in memory area MS(3) at 12:00.

Next, in Step 307, a determination is made as to whether or not there is a display command from the elevator control device 6 present in the RAM 46 memory area COM, and, according to that result, a general information display command and an elevator operating state display command are respectively sent in Steps 308 and 309.

Next, returning to Step 302, processing by the above Steps 303 and 309 is repeated.

When information to be displayed on the in-car display 1A and the landing display 2A is sent to the display control device 5, this information is transferred to the CPU 52 via the transfer circuit 51. The CPU 52 temporarily places this information in the RAM 53. Additionally, information corresponding to a display command is stored in the ROM 54. The CPU selects this various information in accordance with a program stored in the ROM 54 and sends it to the in-car display 1A and the landing display 2A via the transfer circuit 55.

As a result, general information, date information, and time information are displayed on the in-car display 1A as indicated, for example, in Fig. 5, while similar information is simultaneously displayed on the landing display 2A.

Problems the Invention Seeks to Resolve

In conventional elevator display devices such as described above, approximately 1-2 seconds elapse between the Fig. 11 Step 304 output of time information until the Step 308 general information display command. That is, if the information shown in Fig. 10 is stored in RAM 46, then the information in memory area MS(2) will have to be displayed when [the time] reaches 8:30. Therefore general information is sent at 8:30, but time is required until transfer of that information has been completed, and because there is a further requirement for processing time up until the general information output command is sent, there will be a 1–2 second delay in the display of the memory area MS(2) information. For this reason, even though the time display on the in-car display 1A and the landing display 2A reads 8:30, the memory area MS(2) information will [only] be displayed after several seconds have elapsed.

Also, because no determination is made during this period as to whether or not the clock IC 43 has been updated, the general information will be displayed with an incorrect display of the time, leading to possible user confusion due to incorrect information.

The present invention was undertaken to resolve the above problems, and has the object of obtaining an elevator display device capable of synchronizing the time displayed on displays installed in such places as elevator cars or landings with general information which varies depending on the time.

Constitution

Means for Resolving Problem

The present invention comprises a clock means for outputting time information; a message input means for setting general information and the display time thereof; a display installed in at least one of either an elevator car or an [elevator] landing; an information selection means which inputs said time information and general information and outputs said time information each time the time changes, sending said general information at a time which is exactly a specified period prior to a designated display time; first, second, and third storage means which store information to be displayed on said display; and a display output means which causes said information output from said information selection means to be stored in either said first or said second storage means, and to be displayed on said display at a designated display time, causes new said general information sent from said information selection means during this display to be stored in the other of either said first or said second storage means, and to be displayed at a designated display time on said display, and causes time information sent from said information selection means to be stored on said third storage means and to be displayed on said display.

Operation

In the present invention, a display selection means sends general information at a time which is a specified time interval before the designated display time. The display output means causes this information to be stored to one of either a first or a second memory means and to be displayed at a designated display time, and during this display causes new general information sent from the display selection means to be stored in the other of the first and second memory means, and to be displayed at a designated display time. Therefore the time delay required to transfer general information and the processing delay until the output display output instruction occurs are eliminated.

Also, the time information sent from the information selection means is caused to be stored in a third memory means and displayed, so that the time information and the display of general information designated for that time can be synchronized.

Embodiment

Fig. 1 is a block diagram showing the constitution of an embodiment of the present invention. In the figure, elements identical to those in Fig. 5 are given the same reference numerals; explanation thereof is omitted.

Here the information control device 4 comprises a clock means 4A which outputs time information, a transfer means 4B which takes in information set by the message input device 3, a transfer means 4C which transfers display information to the display control device 5, and a display selection means 4D which inputs the message input device 3 general information, clock means 4A time information, and elevator control device 6 display commands, successively sending general information at a time which is a exactly a specified interval before the designated display time, time information each time the time changes, and display commands.

The display control device 5 comprises a transfer means 5A which takes in information from the information control device 4, two memory means 5B, 5C which split [off] and store general information to be displayed on the displays 1A, 2A, a memory means 5D which stores time information, a memory means 5E which stores elevator operating information, and a display output means 5P, which stores general information sent from the display selection means 4D in one of either of the memory means 5B, 5C, causes [that information] to be displayed on displays 1A, 2A at a designated display time, stores new general information sent from the display selection means 4D during this display in the other of either of the memory means 5B, 5C, and causes [that information] to be displayed on displays 1A, 2A at designated display time, while at the same time causing time information sent from the display selection means 4D to be stored in the memory means 5D and displayed

on the displays 1A, 2A, as well as causing the operating information in memory means 5E to be displayed on displays 1A, 2A in response to elevator control device 6 display commands.

The functions of the information control device 4 shown in Fig. 1 can be implemented by the same hardware as shown in Fig. 7. Similarly, the functions of the display control device 5 shown in Fig. 1 are implemented by the same hardware as shown in Fig. 8. Therefore the detailed operations of the display selection means 4D and the display output means 5P are respectively explained using the Fig. 2 flow chart depicting the CPU 44 processing sequence and the Fig. 3 flow chart depicting the CPU 52 processing sequence.

First, the CPU 44 which constitutes the information control device 4 performs an initialization in Step 101, as shown in Fig. 2, performs repeated start processing in Step 102, determines whether or not there has been a change in time information in Step 103, and if there is a change, sends time information to the display control device 5 in Step 104.

Next, a determination is made in Step 105 as to whether [the time] has reached X seconds before the general information switchover time; if so, new general information is sent in Step 106.

X is here determined by the following formula:

$$X = t + a,$$

where

t: General information transmission time

a: Degree of switchover margin (3-5 seconds)

This means, for example, that if as shown in Fig. 10 the designated display time for the information in the memory area MS(1) is 7:00-8:30 as shown in memory area TS(1), TE(1), and the designated display time for the information in the memory area MS(2) is 8:30-10:00 as shown in memory area TS(2), TE(2), then given a general information transfer time t = 1 second and a switchover margin a = 4

seconds, the memory area MS(2) general information will be sent to the display control device 5 when the information in clock IC 43 reaches 8:29:55.

Next, the CPU 44 determines in Step 107 whether or not there is a command to display the operating state [from] the elevator control device 6. If not, then a determination is made in Step 107 as to whether or not the general information switchover time has arrived. If the switchover time has not arrived, the previous general information display command will be sent to the display control device 5; if the switchover time has arrived, then a new general information display command will be sent to the display control device 5 in Step 110, and if it is determined that there is a command to display the operating state, an elevator operating state display command will be sent [to the display control device 5] in Step 111.

In the meantime the CPU 52 which comprises the display control device 5, as shown in the Fig. 3 flowchart, performs initialization in Step 201, performs repeated start processing in Step 202, and determines whether or not new general information has been received in Step 203.

If it is here determined that new general information has been received, a determination is made in Step 204 as to whether the current display information is the [information] stored in memory area DM(1) in RAM 53 (Fig. 4) as the first memory means, and if it is what is stored in this memory area DM(1), then in Step 205 the new general information is caused to be stored in memory area DM(2) of the RAM 53 as the second memory means; conversely if it is not what is stored in the memory area DM(1), then in step 206 the new general information is caused to be stored in the memory area DM(1). This storage state is shown in Fig. 4(a). Time information sent from the information control device 4 is stored in a memory area not shown in the diagram. Elevator control information is stored in ROM 54, as shown in Fig. 4(b).

Next, in Step 207 the CPU 52 determines whether or not the sequentially changing time information has changed by Y minutes; if it has not changed, then the

time information and general information currently displayed are deleted in Step 208, and Step 209 the delete flag is set in the Fig. 4(a) memory area PREF. If a determination is made in Step 207 that there has been a change in time information, then this delete flag is cleared in Step 210.

Next, the CPU 52 determines in Step 211 whether or not an elevator operating information display command has been transferred. If there is no display command, then a determination is made as to whether or not the delete flag has been set in Step 212, while if there is a display command, the ROM 54 operating information is displayed in Step 213, after which the processing in Steps 202-212 is repeated. Steps 202-212 are also repeated in the case where the delete flag has been set in Step 212, and conversely when the deletion flag is not set, the processing from Step 214 forward is carried out.

That is, a determination is made in Step 215 as to whether there is a display command present for either the time information or the previous general information, and the display time is updated in accordance with the result of this determination. New general information is displayed in Step 216, the previous general information is displayed in Step 218, and each returns to the repeated processing of Step 202.

Fig. 5 shows the display state of the in-car display 1A corresponding to each of these processing [steps]. (a) in that figure is for sequentially changed time information; (b) represents the time when time information has not changed for Y minutes.

Thus, according to this embodiment, general information is sent to the display control device 5 at a time prior to the switchover time, and switchover of the general information occurs simultaneously with the time switchover when the display time for this general information is reached.

When there is no change in the time information sent from the information control device 4, this is viewed as a clock IC 43 anomaly, and time information and general information are deleted, thereby preventing transmission of incorrect information to users.

In the above embodiment we discussed a case in which displays were provided in both the elevator car and the landing, with information displayed on both, but the present invention is not limited thereto, and needless to say may also be applied to cases in which the display is provided in only the elevator car or the landing.

Effect of the Invention

As is clear from the explanation above, the present invention makes it possible to synchronize and display the time [of day] and a general message which changes according to the time. Also, these displays are deleted during time anomalies, so information displayed is more reliable as compared to displaying erroneous information.

4. Brief Explanation of Figures

Fig. 1 is a block diagram showing the constitution of an embodiment of the invention. Figs. 2 and 3 are flow charts which explain the operation of this embodiment. Figs. 4(a) and (b) are diagrams showing the information storage state in the memory devices which form the embodiment; Figs. 5(a) and (b) are information display state diagrams for the display devices which form the same embodiment; Fig. 6 is a summary diagram of a conventional elevator display device; Figs. 7 and 8 are block diagrams showing the hardware composition of main constituent elements of the device; Fig. 9 is an information display state diagram of the main elements which form the device; Fig. 10 is an information storage state diagram of the memory devices which form the device; Fig. 11 is a flow chart to explain the operation of the device.

1A:	In-Car Display
2A:	Landing Display
3:	Message Input Device

4:	Information Control Device
4A:	Clock Means
4D:	Display Selection Means
5:	Display Control Device
5B-5E:	Memory Means 1-4
5F:	Display Output Means
6:	Elevator Control Device

Applicant Agent: Kazuo Satoh

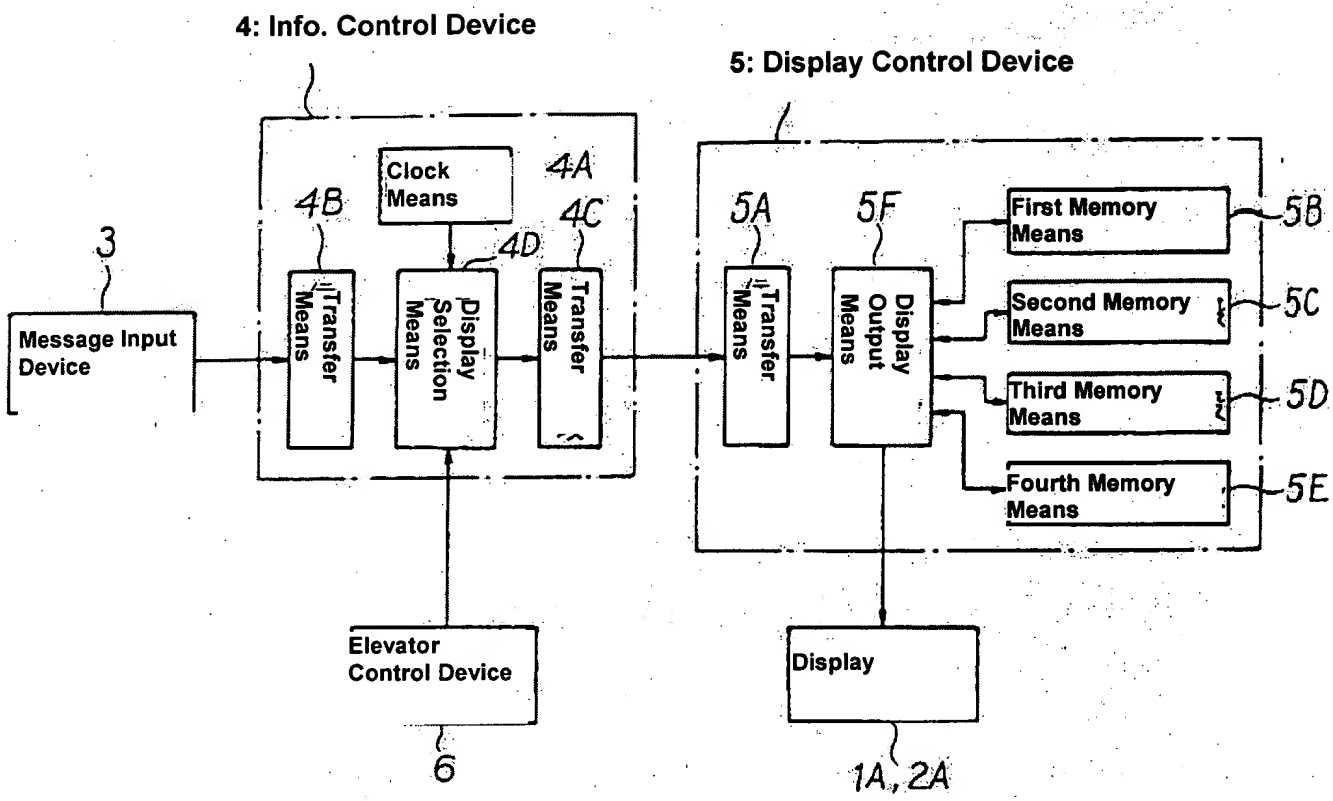

4: Info. Control Device
5: Display Control Device
3
Message Input Device
4B
Transfer Means
Clock Means
4A
4C
4D
Display Selection Means
Transfer Means
5A
Transfer Means
5F
Display Output Means
First Memory Means
5B
Second Memory Means
5C
Third Memory Means
5D
Fourth Memory Means
5E
Elevator Control Device
6
Display
1A, 2A

Fig. 1

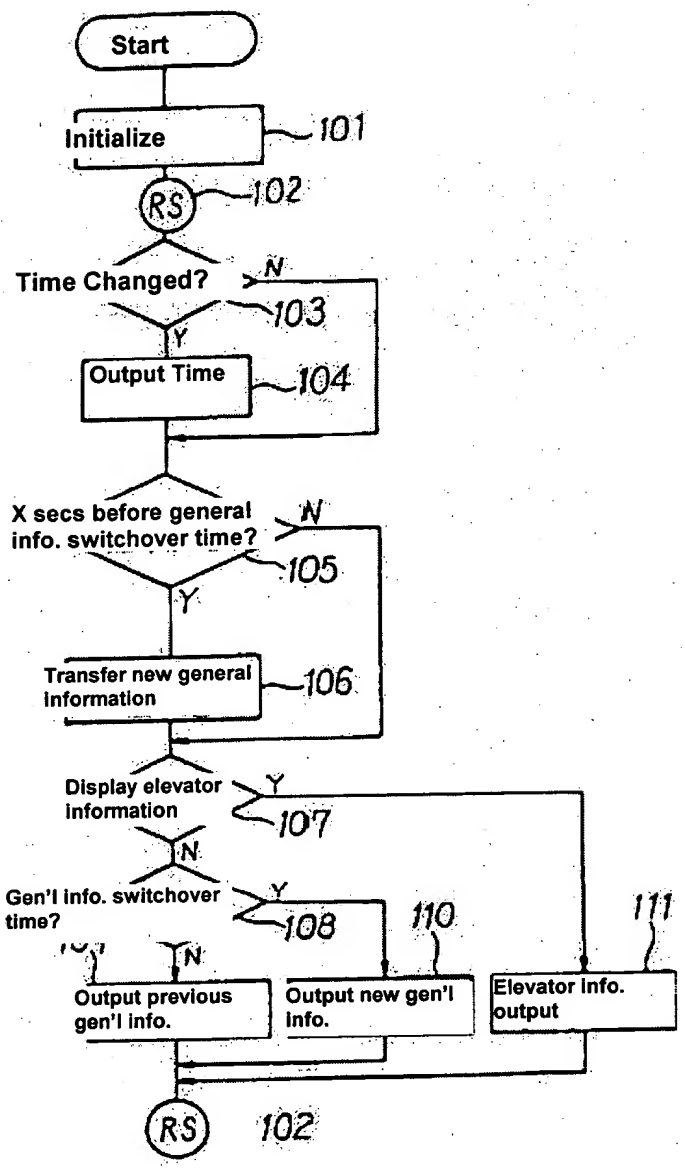

Start
Initialize
101
RS
102
Time Changed?
N
103
Y
Output Time
104
X secs before general info. switchover time?
N
105
Y
Transfer new general information
106
Display elevator information
Y
107
N
Gen'l info. switchover time?
Y
108
110
111
N
Output previous gen'l info.
Output new gen'l info.
Elevator info. output
RS
102

Fig. 2

Fig. 3

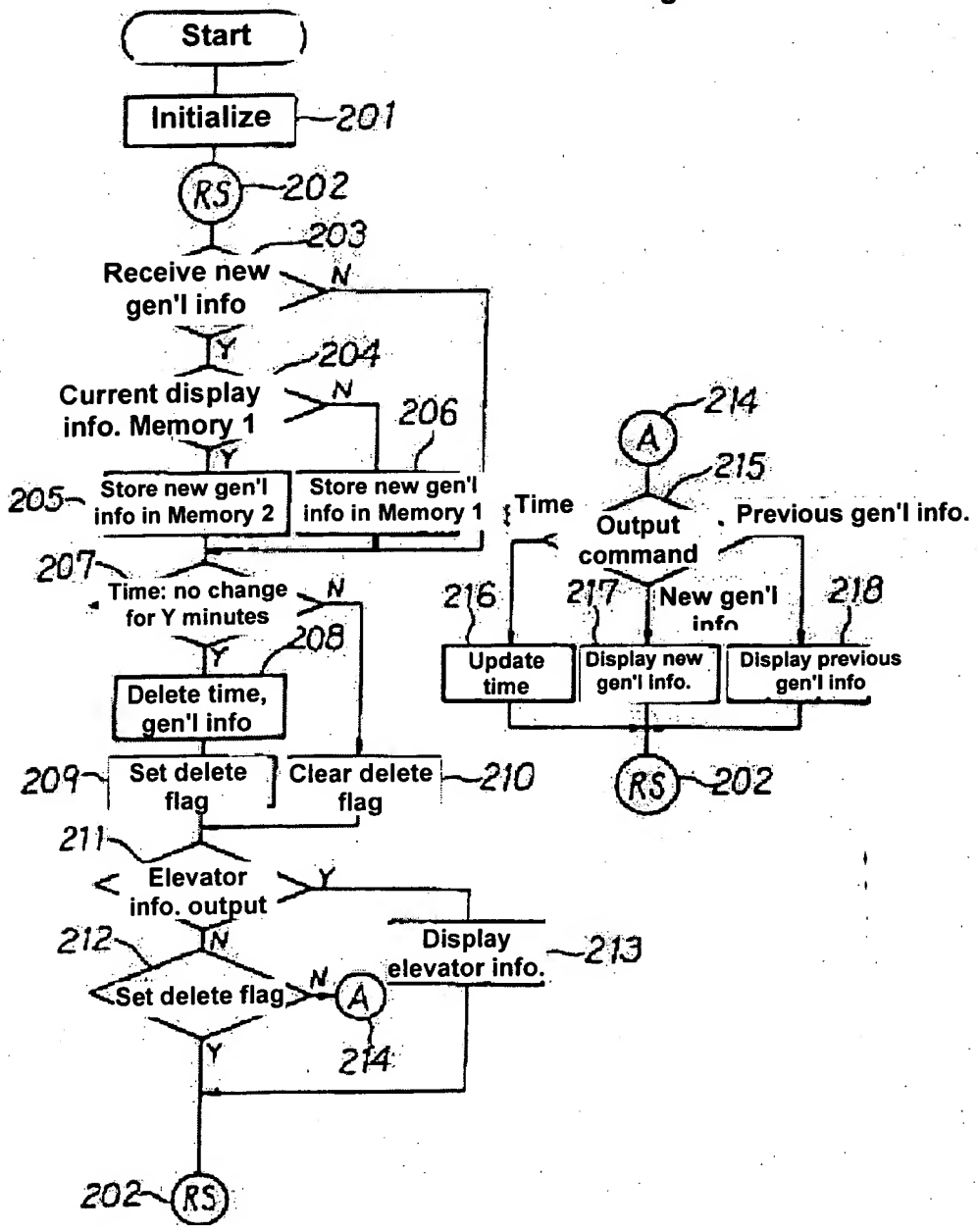

Start
Initialize
201
RS
202
203
Receive new gen'l info
N
Y
204
Current display info. Memory 1
N
206
Y
205
Store new gen'l info in Memory 2
Store new gen'l info in Memory 1
207
Time: no change for Y minutes
N
Y
208
Delete time, gen'l info
209
Set delete flag
Clear delete flag
210
211
Elevator info. output
Y
N
212
Set delete flag
N
A
214
Y
Display elevator info.
213
202
RS
214
A
215
Time
Output command
Previous gen'l info.
216
217
New gen'l info
218
Update time
Display new gen'l info.
Display previous gen'l info
RS
202

Fig. 4

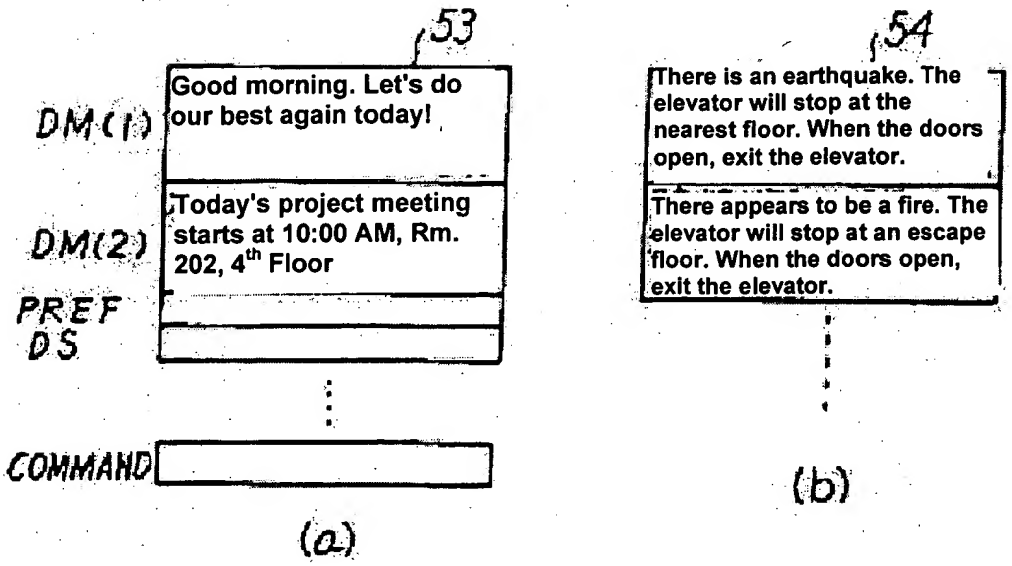

53
DM(1)
Good morning. Let's do our best again today!
DM(2)
Today's project meeting starts at 10:00 AM, Rm. 202, 4th Floor
PREF
DS
COMMAND
(a)
54
There is an earthquake. The elevator will stop at the nearest floor. When the doors open, exit the elevator.
There appears to be a fire. The elevator will stop at an escape floor. When the doors open, exit the elevator.
(b)

Fig. 5

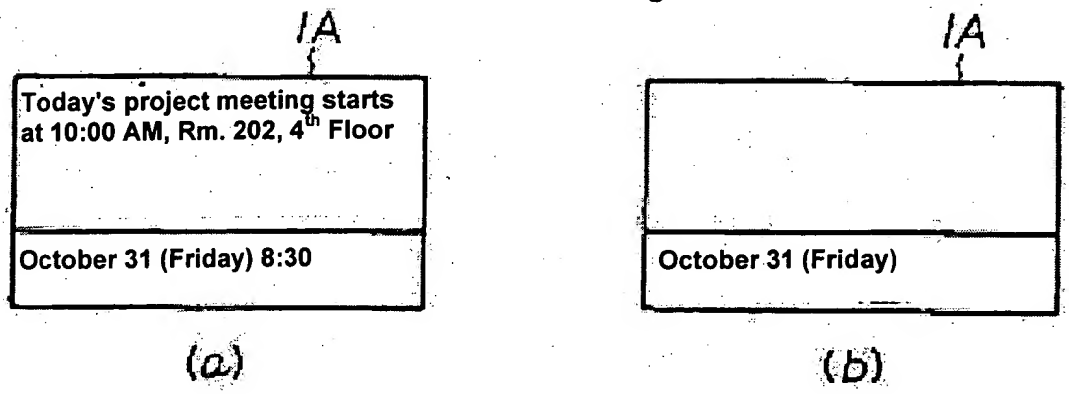

1A
Today's project meeting starts at 10:00 AM, Rm. 202, 4th Floor
October 31 (Friday) 8:30
(a)
1A
October 31 (Friday)
(b)

Fig. 6

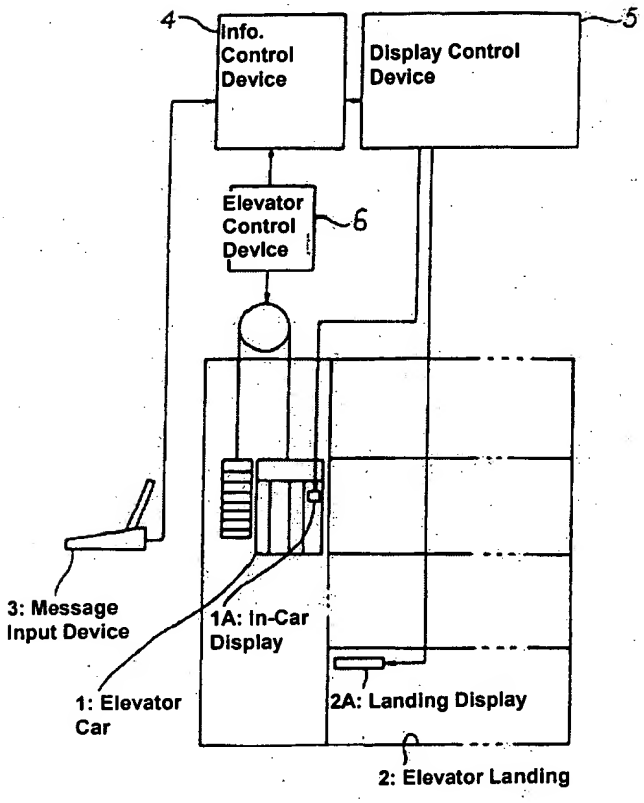

4
Info. Control Device
Display Control Device
5
Elevator Control Device
6
3: Message Input Device
1A: In-Car Display
1: Elevator Car
2A: Landing Display
2: Elevator Landing

Fig. 7

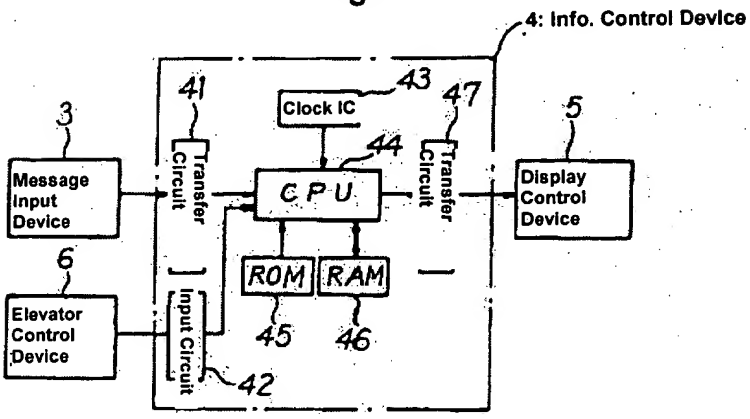

4: Info. Control Device
41
43
47
3
Clock IC
44
5
Transfer Circuit
Transfer Circuit
Message Input Device
CPU
Display Control Device
6
ROM
RAM
Elevator Control Device
Input Circuit
45
46
42

Fig. 8

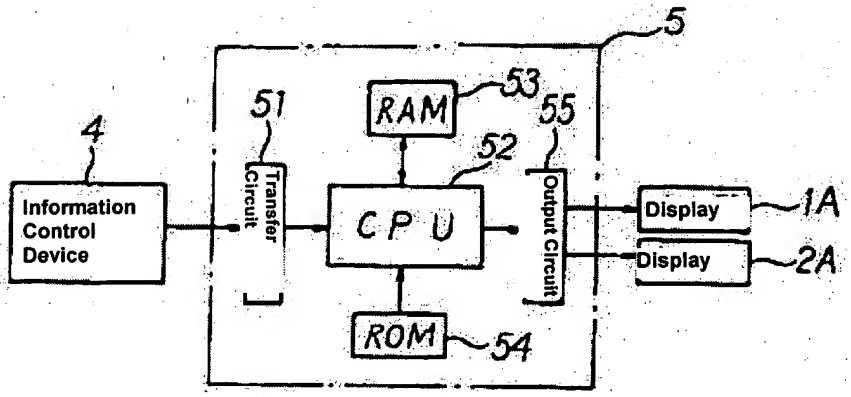


Fig. 9

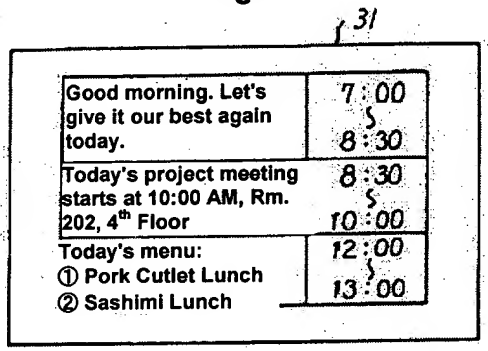


Fig. 10

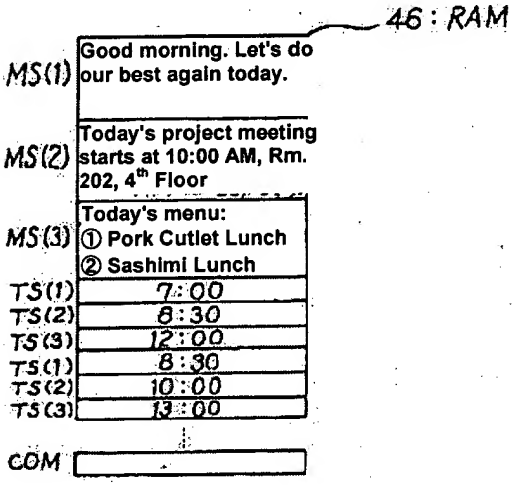
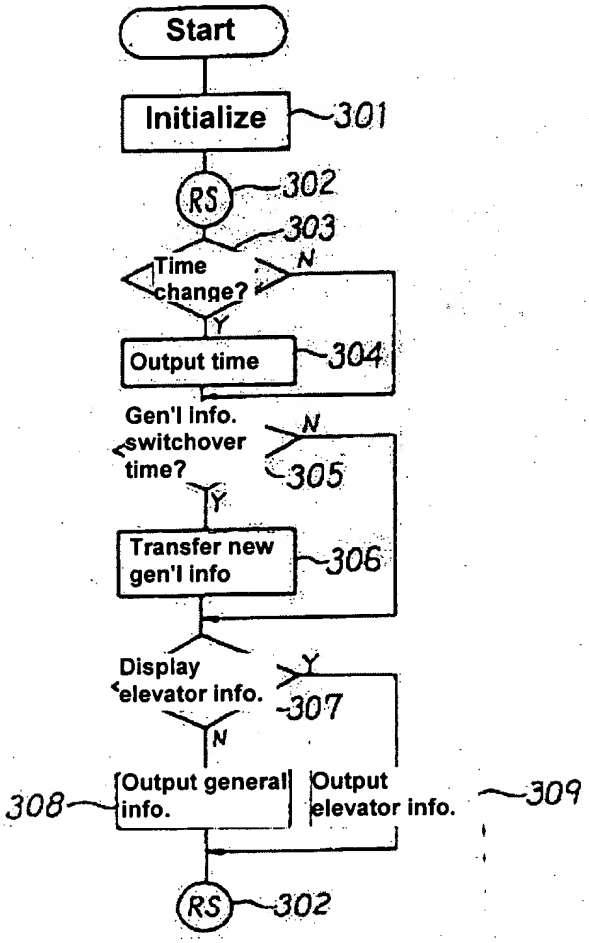


Fig. 11


Start
Initialize
301
RS
302
303
Time change?
N
Y
Output time
304
Gen'l info. switchover time?
N
305
Y
Transfer new gen'l info
306
Display elevator info.
Y
307
N
308
Output general info.
Output elevator info.
309
RS
302

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	(22) Date of Application	H2 (1990) September 17
(72) Inventor	Tohru Ishikawa	% Toshiba Fuchu Factory 1 Toshiba-machi, Fuchu-shi, Tokyo
(71) Applicant	Toshiba Co., Ltd.	72 Horikawa-cho, Saiwai-ku, Kawasaki-shi, Kanagawa
(74) Agent	Patent attorney Kazuo Sado	and 3 others

SPECIFICATION

1. TITLE OF THE INVENTION

An Elevator Display Apparatus

2. SCOPE OF PATENT CLAIMS

An elevator display apparatus comprising: a clock means to output the time information; a message input apparatus to establish the general information and display information; a display apparatus which is installed in at least the elevator car and the elevator platform; an information selection means to not only input said time information and general information as well as to output said time information whenever the time changes but also to transmit said general information at only a specific time as indicated by the display time; a first, second and third recording means to record the information that must be recorded on said display apparatus; and a display output means to record said information that was transmitted from said information selection means onto either said first or second recording means and then display this onto said display apparatus at the specified display time, and in addition to recording said general information that was newly transmitted from said information selection means within this display on either said first or second recording means and then recording in onto said display apparatus at the specified display time, this display output means will record the time information that is transmitted from said information selection means onto said third recording means and display it onto said display apparatus.

3. DETAILED DESCRIPTION OF THE INVENTION

[PURPOSE OF THE INVENTION]

(FIELD OF INDUSTRIAL APPLICATION)

The present invention relates to an elevator display apparatus to display both the time and other messages onto the display apparatus that is installed either at least within the elevator car or on the elevator platform.

(PRIOR ART)

In recent years, it has become common to install display apparatus within the elevator car or on the elevator platform as general information for the elevator user, and for the display apparatus to display the elevator operation status.

Also, in recent years, it has become common to not only display the elevator operation status,

but to install a message input apparatus such as a personal computer, and to display the general information within the building onto this display apparatus as well.

Figure 6 is a structural diagram of this type of conventional display apparatus. In this Figure, the car display apparatus 1A is installed within the elevator car 1, and there is a platform display apparatus 2A installed in the elevator platform 2. Also, the general information and the other display time information is set up within the message input apparatus 3 such as personal computer is set to the information control apparatus 4 in order to be displayed onto these display apparatus. In addition to storing this information, the information control apparatus 4 will store the display indication commands that are sent from the elevator control apparatus 5, and after performing a certain treatment, it will send the internally stored information and the display indication commands to the display apparatus control apparatus 6. The display apparatus control apparatus 5 will output the information to the car display apparatus 1A and the platform display apparatus 2A according to these display indication commands.

Figure 7 is a block diagram showing the detailed structure of the information control apparatus 4, and it consists of a transmission circuit 41 that receives the information from the message input apparatus 3, an input circuit 42 that receives the information from the elevator control apparatus 6, a clock IC 43 to generate the time information, a CPU 44 that performs each time of calculation processing, a ROM 45 that will write the control procedure and fixed data required for this calculation processing and will provide this as necessary to the CPU 44, a RAM 46 which is used as a input/output buffer and as a working area for the calculation processing of the CPU 45, and a transmission circuit 47 that transmits the information to the display apparatus control apparatus 5.

Figure 8 is a block diagram that shows a detailed structure of the display apparatus control apparatus 5, comprising a transmission circuit 51 that receives the information from the information control apparatus 4, a CPU 52 that performs various types of calculation processing, a RAM 53 that writes in advance the control procedure and fixed data required in the calculation processing of the CPU 52 and provides it as necessary to the CPU 52, and a transmission circuit 55 that transmits the information to the display apparatus 1A and 1B, and as necessary, to a ROM 54 of the CPU 52.

Here, for instance, information using the message input apparatus 3 is set up such that it will be displayed onto the display screen 31 of Figure 9 as the general information and display time. This information is transmitted to the CPU 44 via the transmission circuit 41. The CPU 44 will store this information in the RAM 46. On the other hand, the display indication commands in order to display the elevator operation state onto the car display apparatus 1A and the platform display apparatus 2A will be transmitted from the elevator control apparatus 6 to the information control apparatus 4. These display indication commands will be transmitted to the CPU 44 via the input circuit 42. The CPU 44 will store these display indication commands into the RAM 46 in conjunction with the display indication commands of the time information and the general information. Figure 10 shows the state wherein this information has been stored within the RAM 46, and the general information is stored within the memory region MS (1) ~ MS (3), the display initiation time will be stored within the memory region TS (1) ~ TS (3), the display completion time will be stored within the memory region TE (1) ~ TE (3), and the display indication commands will be stored within the memory region COM.

Also, when the display indication commands are stored within the RAM 46, the CPU 44 will perform the calculation processing according to the ROM 45 program, and it will transmit the general information, the clock IC 43 time information and the display indication commands to the display apparatus control apparatus 5. We will explain the calculation processing operation at this time using the flow chart in Figure 11.

First of all, the output information is initially set up within Step 301, and after performing a repetitive processing in Step 302, a determination will be made in Step 303 as to whether the output information of the clock IC 43 has changed or not. Then, when changes have been made, the time information will be transmitted to the display control apparatus 5 in Step 304.

Next, in Step 305, a determination will be made as to whether or not the time has come for the exchange of the general information, and if it is the exchange time, then the new general information will be transmitted to the display control apparatus 5 in Step 306. In other words, by comparing the clock IC 43 time information and the recorded data within the memory region TS (1) ~ TS (3) as shown in Figure 10, the information in memory region MS (1) will be transmitted to the display control apparatus 5 at 7:00, the information in memory region MS (2) will be transmitted at 8:30, and the information in memory region MS (3) will be transmitted at 12:00.

Next, in Step 307, a determination will be made as to whether there is a display indication command from the elevator control apparatus 6 in the memory region COM of RAM 46, and according to those results, in Step 308, the display indication commands of the general information

will be transmitted to the display control apparatus 5, and in Step 309, the display indication commands of the elevator operation information will be transmitted.

Next, the system will return to the processing in Step 302, and the processing of the above Steps 303 ~ 309 will be repeated.

In this way, when the information to be displayed on the car display apparatus 1A and on the platform display apparatus 2A is transmitted to the display apparatus control apparatus 5, this information will be transmitted to the CPU 52 via the transmission circuit 51. The CPU 52 will store this information temporarily in the RAM 53. In the ROM 54, there is information corresponding to the display indication command stored. Then, in addition to selecting this information according to the program stored within the ROM 54, the CPU 52 will send it to the car display apparatus 1A and the platform display apparatus 2A via the transmission circuit 55.

As a result, as shown in Figure 5(a), at the same time that the general information, the date information and the time information is displayed on the car display apparatus 1A, the same information will be displayed on the platform display apparatus 2A.

(PROBLEM TO BE SOLVED BY THE INVENTION)

In the above conventional elevator display apparatus, 1 ~ 2 seconds will elapse after the time information is outputted in Step 304 of Figure 11 until the display indication commands of the general information are outputted in Step 308. In other words, if the information shown in Figure 10 is recorded in RAM 46, then it will be necessary to display the information of the memory region MS (2) at 8:30. Therefore, while the general information will be sent at 8:30, a certain period of time is required until the transmission of that information is completed, and further, as processing time is required until the general information output indication is transmitted, the information of the memory region MS (2) will be displayed after a 1 ~ 2 second delay. Therefore, even if the display time on the car display apparatus 1A and the platform display apparatus 2A shows a time of 8:30, the information of the memory region MS (2) will be displayed after a few seconds.

Also, during this period, as there is no determination as to whether the time of the clock IC 43 has been changed or not, the general information will be displayed with the incorrect time display, leading to concerns that the user may be confused by the incorrect information.

The present invention was created in order to resolve the above problems, and aims to provide an elevator display apparatus that can synchronize a clock that will be displayed onto the display apparatus that is installed within the elevator car or on the elevator platform and the general information with display information that will differ depending on the time.

(CONSTITUTION OF THE INVENTION)

(MEANS FOR SOLVING THE PROBLEM)

The present invention comprises a clock means to output the time information, a message input apparatus to establish the display time and the general information, a display apparatus that is installed in either the elevator car or the elevator platform, an information selection means that will input said time information and the general information, and in addition to transmitting said time information whenever the time changed, it will transmit said general information at a time that is a certain period earlier than the indicated display time, a first, second and third recording means to record the information to be displayed on said display apparatus, and a display output means that will record said general information that is transmitted from said information selection means onto either said first or second recording means and display it on said display apparatus at the indicated display time, and in addition to recording said new general information that is transmitted from said information selection means during this display onto either said first or second recording means and displaying it on said display apparatus at the indicated display time, it will record the time information that is transmitted from said information selection means onto said third recording means and display it onto said display apparatus.

(OPERATION)

In the present invention, by having the display selection means transmit the general information at a time that is a certain period earlier than the display time that is indicated, the display output means will record this information onto either the first or second recording means, and displaying the indicated display time, the new general information that is transmitted from the display selection means during this display period will be recorded on either the first or second recording means and will then be displayed during the indicated display period, so there will be no time delay in transmitting the general information, nor will there be a processing delay until the display output indication is outputted.

Also, as it is possible to record the time information that is transmitted from the information selection means onto the third recording means and display it, it is possible to synchronize the display of the general information at the time indicated and the time information.

(EXAMPLE OF EMBODIMENT)

Figure 1 is a block diagram showing the structure of the first example of embodiment of the present invention, and within the Figure, we will use the same symbols for the same components as were shown in Figure 5, so we will omit their explanation.

Here, the information control apparatus 4 comprises a clock means 4A that will output the time information, a transmission means 4B that will take the information that is established in the message input apparatus 3, a transmission means 4C to transmit the display information on the display apparatus control apparatus 5, and a display selection means 4D that will input the display indication commands of the elevator control apparatus 6 and the time information of the clock means 4A as well as transmit the general information at a time that is a certain period prior to the indicated display time, and then, transmitting the time information whenever the time changes, it will further transmit the display indication commands.

Also, the display apparatus control apparatus 5 comprises a transmission means 5A that will take the information of the information control apparatus 4, two recording means 5B and 5C to separate and record general information that should be displayed onto the display apparatus 1A and 2A, a recording means 5D to record the time information, a recording means 5E to record the elevator operation information, and a display output means 5F that will record the general information that is transmitted from the display selection means 4D into either the recording means 5B or 5C and display it at the indicated display time on the display apparatus 1A and 2A, and recording the new general information that is transmitted from the display selection means 4D during this period onto either the recording means 5B or 5C, it will not only display it at the indicated display time onto the display apparatus 1A and 2A, but it will record the time information transmitted from the display selection means 4D onto the recording means 5D and display it onto the display apparatus 1A and 2A, and further, it will display the operation information of the recording means 5E in relation to the display indication commands of the elevator control apparatus 6 onto the display apparatus 1A and 2A.

The functionality of the information control apparatus 4 that is shown in Figure 1 can be realized through the same hardware as is shown in Figure 7, and in the same way, as it is possible to realize the functionality of the display apparatus control apparatus 5 that is shown in Figure 1 through the same hardware as in Figure 8, and we will explain the detail operation of the display output means 5F using the flowchart in Figure 3 showing the processing procedure of the CPU 52 as well as the detailed operation of the display selection means 4D using the flowchart in Figure 2 showing the processing procedure of the CPU 44 corresponding to the present invention.

First of all, the CPU 44 that forms the information control apparatus 4, as shown in Figure 2, will initialize in Step 101, and repeating Step 102 and passing the start process, it will determine in Step 103 whether the time information has changed or not, and if it has changed, then it will transmit the time information to the display apparatus control apparatus 5 in Step 104.

Next, in Step 105, it will determine whether it is X seconds early in relation to the display exchange time of the general information, and it is the correct time, then in Step 106, it will transmit the new general information.

Here, X will be determined using the following equation.

$X = t + \alpha$ ... (1)

Where t: the general information transmission time and α: the exchange level of freedom (3 ~ 5 seconds)

For instance, as shown in Figure 10, if 7:00 ~ 8:30 is displayed for the display indication time of the information of memory region MS (1) in memory region TS (1) and TE (1), and 8:30 ~ 10:00 is displayed for the display indication time of the information of memory region MS (2) in memory region TS (2) and TE (2), then using the general information transmission time t = 1 second and the exchange freedom α = 4 seconds, then when the information of the clock IC 43 becomes 8:29:55, then the general information of the memory region MS (2) will be sent to the display apparatus control apparatus 5.

Next, in Step 107, the CPU 44 will determine whether there is an operation statue display indication command of the elevator control apparatus 6, and when there is no command, then in Step 107, it will determine whether it is the exchange time for the general information. Then, if it is not the exchange time, then the display indication command of the previous general information will be sent to the display apparatus control apparatus 5, if it is the exchange time, then in Step 110, the display indication command of the new general information will be sent, and further, when the determination has been made that there is an operation status display indication command in Step 107, then the display indication command of the elevator operation information will be sent to the display control apparatus 5 in Step 111.

Thereafter, the processing of Steps 102 ~ 111 will be repeated.

On the other hand, the CPU 52 that forms the display apparatus control apparatus 5 will, as shown in the flowchart in Figure 3, be initialized in Step 201, and repeating Step 202, it will pass the start process, and in Step 203, it will determine whether it has received new general information.

Here, if the determination is made that new general information has been received, a determination will be made as to whether the current display information is recorded into the memory region DM (1) of the RAM 53 (Figure 4) as the first recording means in Step 204, and if it is recorded into this memory region DM (1), then the new general information will be recorded into the memory region DM (2) of the RAM 53 as the second recording means in Step 205; and in contrast, if the determination is made that it is not recorded into the memory region DM (1), then the new general information will be recorded into the memory region DM (1) in Step 206. This recording state is shown in Figure 4(a). The time information that is transmitted from the information control apparatus 4 will be recorded onto the memory region that is not shown in the Figure. Also, the elevator control information will be recorded onto the ROM 54 as shown in Figure 4(b).

Next, in Step 207, the CPU 52 will determine whether the time information that should be changed has changed in Y minutes, and if there have been no changes, then in Step 208, the time information and the general information that are currently being displayed will be removed, and in Step 209, the removal plug will be set in the memory region PREF in Figure 4(a), and if the determination is made at the time information has been changed in Step 207, then in Step 210, this removal plug will be cleared.

Next, in Step 211, the CPU 52 will determine whether the display indication command of the elevator operation information has been transmitted, and when this display indication command is not present, then in Step 212, a determination will be made as to whether a removal plug has been set, but on the other hand, when this display indication command is present, then in Step 213, the operation information of the ROM 54 will be displayed, and thereafter, the processing of Step 202 ~ 212 will be repeated. Also, when a removal plug has been set in Step 212, then the processing of Step 202 ~ 212 will be repeated, and in contrast, when the removal plug has not been set, the processing after Step 214 will be as follows.

In other words, in Step 215, a determination will be made as to whether the display indication command is for the time information, the new general information or for the previous general information, and according to these determination results, the display time will be updated in Step 216, the new general information will be displayed in Step 216, and displaying the previous general information in Step 218, each will return to the repetitive processing of Step 202.

Figure 5 shows the display state of the car display apparatus 1A that corresponds to this processing, and in Figure 5(a), the time information is the information that has been changed, and in Figure 5(b), the Y minute time information has not been changed.

In this way, according to the present example of embodiment, the general information will be sent to the display apparatus control apparatus 5 at a time that is before the exchange time, and when it has become the display time for this general information, then an exchange of the general information will be performed at the same time as the exchange of the time.

Also, when the time information that is sent from the information control apparatus 4 is unchanged, then this will be viewed as an abnormality of the clock IC 43, and the time information as well as the general information will be removed, so it is possible to prevent a state wherein the incorrect information is transmitted to the user.

In the above example of embodiment, a display apparatus is installed in both the elevator car and the elevator platform, and we explained the display of information in both of these apparatus, but the present invention is not limited to this example of embodiment, and it goes without saying that it is possible to apply the present invention without installing both the elevator car display apparatus or the platform display apparatus.

(EFFECT OF THE INVENTION)

As is clear from the above explanation, according to the present invention, it is possible to synchronize and display the time and the general information that is exchanged along with the time on the display apparatus. Also, as it is possible to remove this display when there is an abnormality with the time, in comparison to displaying the incorrect information, it is possible to display high quality information.

4. BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a block diagram showing the structure of the example of embodiment of the present invention. Figure 2 and Figure 3 are flowcharts to explain the operation of this example of embodiment.

Figures 4(a) and (b) are diagrams showing the information recording state of the recording apparatus that forms the present example of embodiment. Figures 5(a) and (b) are diagrams showing the information display state of the display apparatus that forms the present example of embodiment. Figure 6 is a structural diagram showing a conventional elevator display apparatus. Figure 7 and Figure 8 are block diagrams that show the hardware structure of the main components that form the present example of embodiment. Figure 9 is a diagram showing the information display state of the main components that form the present example of embodiment. Figure 10 is a diagram showing the information recording state of the recording apparatus that forms the present example of embodiment. Figure 11 is a flow chart to explain the operation of the present example of embodiment.

1A . . . car display apparatus, 2A . . . platform display apparatus, 3 . . . message input apparatus, 4 . . . information control apparatus, 4A . . . clock means, 4D . . . display selecting means, 5 . . . display apparatus control apparatus, 5B ~ 5E . . . first ~ fourth recording apparatus, 5F . . . display output means, 6 . . . elevator control apparatus.

Patent Applicant Agent Kazuo Sado

[see source for figures and numbers]

Figure 2

Start		
Initialization		
RS		
Time change	N	
Y		
Time output		
General information display X seconds before the exchange time	N	
Y		
New general information transmission		
Elevator information display	Y	
N		
General information display t exchange time	Y	
N		
Previous general information output	New general information output	Elevator information output
RS		

Figure 1

	4: Information control apparatus			5: Display apparatus control apparatus		
		Clock means				First recording means
Message input apparatus	Transmission means	Display selecting means	Transmission means	Transmission means	Display output means	Second recording means
						Third recording means
						Fourth recording means
		Elevator control apparatus		Display apparatus		

[see source for figure and numbers]

Figure 3

Start				
Initialization				
RS				
New general information received	N			
Y				
Current display information memory 1	N			
Y			A	
Store new general information in memory 2	Store new general information in memory 1	Time	Output command	Previous general information
No change to time Y minutes	N		New general information	
Y		Update time	New general information display	Previous general information display
Remove time general information			RS	
Set removal plug	Clear removal plug			
Elevator information output	Y			
N	Elevator information display			
Set removal plug				
RS				

Figure 4

DM (1)	Good morning! Let's work hard today.	It's an earthquake! The car will be stopping at the closest floor. When the door opens, please exit the car.
DM (2)	Today's project meeting is at 10:00 am, in Conference Room 202 on the fourth floor.	It appears that there is a fire. The car will be stopping at the emergency evacuation floor. When the door opens, please exit the car.
PREF		
DS		
COMMAND		
	(a)	(b)

Figure 5

1A	1A
Today's project meeting is at 10:00 am, in Conference Room 202 on the fourth floor.	
October 31 (Friday) 8:30	October 31 (Friday)
(a)	(b)

Figure 6

4 information control apparatus; 5 display apparatus control apparatus, 6 elevator control apparatus, 3 message input apparatus, 1elevator car, 1A car display apparatus, 2A platform display apparatus, 2 elevator platform

Figure 7

3 message input apparatus, 6 elevator control apparatus, 41 transmission circuit, 42 input circuit, 43 clock IC, 44 CPU, 45 ROM, 46 RAM, 47 transmission circuit, 4, information control apparatus, 5 display control apparatus

Figure 8

4 information control apparatus, 51 transmission circuit, 53 RAM, 52 CPU, 54 ROM, 55 output circuit, 1A display apparatus, 2A display apparatus

Figure 9

31	
Good morning! Let's work hard today.	7:00 ~ 8:30
Today's project meeting is at 10:00 am, in Conference Room 202 on the fourth floor.	8:30 ~ 10:00
Today's lunch menu is 1) Deep-fried pork cutlet meal 2) Sashimi meal	12:00 ~ 13:00

Figure 10

MS (1)	Good morning! Let's work hard today.
MS (2)	Today's project meeting is at 10:00 am, in Conference Room 202 on the fourth floor.
MS (3)	Today's lunch menu is: 1) Deep-fried pork cutlet meal 2) Sashimi meal
TS (1)	7:00
TS (2)	8:30
TS (3)	12:00
TS (1)	8:30
TS (2)	10:00
TS (3)	13:00
COM	

Figure 11

Start	
Initialization	
RS	
Time change	N
Y	
Time output	
General information exchange time	N
Y	
New general information transmission	
Elevator information display	Y
N	
General information output	Elevator information output
RS	